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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------------|------------------|
| 09/924,575 | 08/09/2001 | Koji Nagata | H&A-104 | 2986 |
| 7590 11/06/2003 Mattingly, Stanger & Malur, P.C. 104 East Hume Avenue Alexandria, VA 22301 | | | EXAMINER NGUYEN, LAM S | |
| | | | ART UNIT 2853 | PAPER NUMBER |

DATE MAILED: 11/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/924,575

Applicant(s)

NAGATA ET AL.

Examiner

LAM S NGUYEN

Art Unit

2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 2 and 9-13 is/are allowed.
- 6) ☒ Claim(s) 3-8 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5, 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 3, 5-6, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Yasuda et al. (US 5260579).

Yasuda et al. disclose a method for charged particle beam exposure using a charged particle beam source, in which a plurality of charged particle beams having different charge quantities are arranged in a matrix consisting of rows and columns (FIG. 6A-C, element 52), comprising the steps of:

separating exposure data for exposing a predetermined pattern on a sample into data of every column for driving said charged particle beam source (FIG. 6A-C: exposure data for irradiating a column; for example L1, is separated and a column is irradiated n times);

converting exposure dose of said column into weighted gradation data (column 9, line 3-17: the intensity of the charged particle beams irradiated at one time is 1/n of the amount of irradiation generally required for forming);

storing said converted data into a storage section (FIG. 13, element 31);

transferring the data from said storage section to a drive section of said charged particle beam source (FIG. 13: data in memory 31 is transferred to elements 32-33); and

irradiating the charged particle beam on a predetermined region on the sample by operating said charged particle beam source in accordance with said transferred data (FIG. 13: elements 32-33 control the deflectors and the electrodes of the blanking aperture array to irradiate the charged particle beams on designed regions).

Referring to claim 5: wherein said irradiating step is added with a deflecting step for deflecting the charged particle beam from said charged particle beam source (column 7, line 57-62).

Referring to claim 8: dividing a predetermined pattern into meshes on a sample forming a map separated into number data for every said mesh and exposure dose data in which a pattern density is considered, the map consisting of a row component and a column component storing the number data and the exposure dose data of said map into a storage section operating said exposure dose data and said number data such that the charged particle beam having exposure dose of said exposure dose data is turned on for the number of said number data and irradiating a plurality of said charged particle beams on the sample by giving the data generated in said operating step to a plurality of said charged particle beams (FIG. 10A-B, FIG. 16A-C).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yasuda et al. (US 5260579) in view of Hiroshi et al. (JP 05-175108).

Yasuda et al. disclose the claimed invention as discussed above except wherein said transferring step has a control clock and includes a step of delaying the gradation data weighted in said control clock with a shift register.

Hiroshi et al. disclose a method and apparatus for exposing with charged particle beams wherein the weighted gradation data, which is an actual exposure data, converted into a binary number and transferred to the shift registers, which are normally operated under a control clock, to efficiently perform a proximity effect correction (Abstract).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the exposing process disclosed by Yasuda et al. such that including the step of delaying the weighted gradation data with a shift register as disclosed by Hiroshi et al. The motivation of doing so is to efficiently perform a proximity effect correction as taught by Hiroshi et al. (Abstract).

Allowable Subject Matter

3. Claims 1-2 and 9-13 are allowed.

Referring to claims 1, 9, 10: The most pertinent cited art fails to disclose the step of deflecting a plurality of said charged particle beams such that a plurality of said charged particle beams arranged in the column direction of said matrix are irradiated on different positions on the sample by data transferred to said control unit at a same time and are irradiated on a same position on the sample by data transferred to said control system at different times. Therefore, the claimed invention is not disclosed by the cited prior art.

Claims 2 and 11-13 are allowed because they depend directly/indirectly on claim 1, 9, or 10.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (703)305-3342. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D. MEIER can be reached on (703)308-4896. The fax phone numbers for the organization where this application or proceeding is assigned are (703)305-3431 for regular communications and (703)305-3432 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

LN

October 28, 2003



HAI PHAM
PRIMARY EXAMINER